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ABSTRACT

A unique teaching strategy is presented, which empowers the instructor with affordable technology to become more effective in the traditional teaching-learning process, and involves a sensory montage of multimedia elements superimposed on a single classroom television monitor. Such computer resources as graphics, animation, QuickTime movies, sound, Hypertext and speech are integrated with external resources like a videodisc player, video microscope, still video camera, photo CD, VCR, camcorder, and CD-ROM audio or graphics to produce a multisensory learning experience. The following subjects are addressed in the strategy: technology requirements; philosophical statement; instructional technology challenge, solution and recommendations; possible software solutions; Hypercard, Supercard, and Digital Chisel; and wiring for video overlay, video switching, and audio mixing. An epilogue reminds educators that multimedia in the hands of a teacher has the power to transform data into meaningful knowledge in the lives of students. Four figures and one table illustrate the strategy. (Author/MAS)

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Dynamic Multimedia Instruction

An Affordable Solution for Mixed-Media Integration on a Single Classroom Television ©

Ronald L. Morris[1]

ABSTRACT: A unique teaching strategy which empowers the instructor with affordable technology to become more effective in the traditional teaching-learning process. A sensory montage of multimedia elements is superimposed on a single classroom projection monitor (television), in rooms with full illumination. Such computer resources as graphics, animation, QuickTime™ movies, sound, Hypertext, and speech are integrated with various external resources like a videodisc player, video microscope, still video camera, Photo CD, VCR, Camcorder and CD-ROM (audio or graphics) to produce a compelling multi-sensory learning experience. All devices are smoothly synchronized and controlled with technology requiring little knowledge of programming or scripting. It is a highly dynamic technique that goes beyond the conventional text-based slide show.

"Technology does not teach, teachers teach, technology is the medium".

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"It is astounding the extent to which companies and the media have focused on what is technologically possible, as opposed to beginning with what consumers want and are willing to pay to get."[2] Like this image, instructional technology may look good on paper but in application prove to be ineffectual.

Technology Requirements

1. Does it improve learning?
2. Does it support the teacher?
3. Is it affordable?
4. Is it to learn and use?

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[2]Nick Nonatiello, *Five Myths of New Media Marketing.* Technology & Media. Vol. 1 No. 1 16 May 1994

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Philosophical Statement

Chinese Proverb
I hear and I forget.

"Just talking ain't teaching"

The lecture is the oldest and most commonly used method of instruction in education today. It is an efficient way to present a large amount of information to many students in a short period of time. Traditionally these lectures have been the least effective method of communication and reliance on lecturing alone has prevented a considerable number of students from reaching their potential.

I see and I remember.

"Two brains are better than one."

Teaching only in the traditional mode, books and lecture, ignores half of the brain's processing capabilities. ***Dynamic Multimedia Instruction*** can transform the traditional lecture into a media-enhanced learning environment. By integrating the learning capability of both the right and left brain hemispheres a synergy is produced where the effect on learning is almost as effective as an actual hands-on experience.

I do and I understand.

"Innovations don't require genius, just a willingness to question the way things have always been done."[3]

This unique approach to multimedia has a number of economic and educational advantages:

- Students show improved retention, comprehension & motivation
- Visual images overcome time, distance, size restraints and linguistic barriers
- Requires no lighting modification or intrusion of cumbersome equipment
- Presentations are recorded onto videotape for lesson review
- All media is integrated and transportable to different locations
- The cost is less than most LCD panels and is significantly more effective

Instructional Technology

Projection Challenge

The greatest challenge in using mixed-media technology in group instruction is finding a projection system that is both educationally useful and affordable. Typical solutions require two different projection devices, one for the computer (Liquid crystal display LCD) and another for video (TV monitor). Until computer technology is capable of processing full-motion, full screen video at an affordable price it is more feasible use external video sources rather than overload the computer with these images.

Projection Solution

Television provides a simple and affordable alternative to expensive projection systems. Using a scan rate converter[4] the computer image is displayed in the standard NTSC[5] format. With genlock and overlay this computer image is simultaneously displayed along with other media devices onto a single classroom TV or recorded onto videotape. Each of these media devices in turn is synchronized and controlled by the computer. It is more cost effective than most LCD panels, and has proven to be significantly more effective.

Television is "Comfortable technology", it is:

- Engaging - some have called it addicting
- Motivational - so much so that some types of programming must be restricted
- Informational - the primary source of information in today's society
- Easy to use - a household appliance
- Readily available - present in over 98% of the homes and most school rooms
- Entraining - a major source of diversion
- Educational - a generation raised on Sesame Street finds TV instruction normal

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[3]Robert J. Kriegel, *If it ain't Broke. Break it.*
[4]See footnote to "Wiring Diagram" for explaination
[5]NTSC = National Television Standards Committee (Format includes Composite and S-Video)

(Yellow Pages)

Most of the traditional devices used to enhance lesson presentations require darkened rooms. Dark places do not enlighten the mind. Newer forms of instructional technology encourage eye-to-eye discussion and note-taking. By leaving room lighting bright and projecting the image onto a TV type monitor each of these newer devices can be incorporated into existing teaching styles without disrupting the normal teaching process

Recommended Technology

1. A **Macintosh computer** with an external 640 by 480 color display monitor.
(Get the biggest you can afford)

2. **Videodisc Player from Pioneer™**
Videodisc *(Laserdisc)* versus CD-ROM
"There is overwhelming agreement, even within the CD-ROM industry, on one thing: most of the titles on the market today are *boring*. They are slow, their plots are weak and the digital video quality (if the disc contains any) is poor in comparison to television or film.... As the word spreads about the serious limitations of CD-ROM technology, many consumers curious about new media are likely to sit out this round, waiting instead for interactive TV applications..."[6]

3.Print-To-Video™ (PTV) scan converter with video overlay by Videolinx™. $595.00
This one piece of equipment provides the missing link in video technology. Superimposing computer graphics on top of an external video source, such as a laser disc image, opens up many new opportunities for creative and interactive presentations.

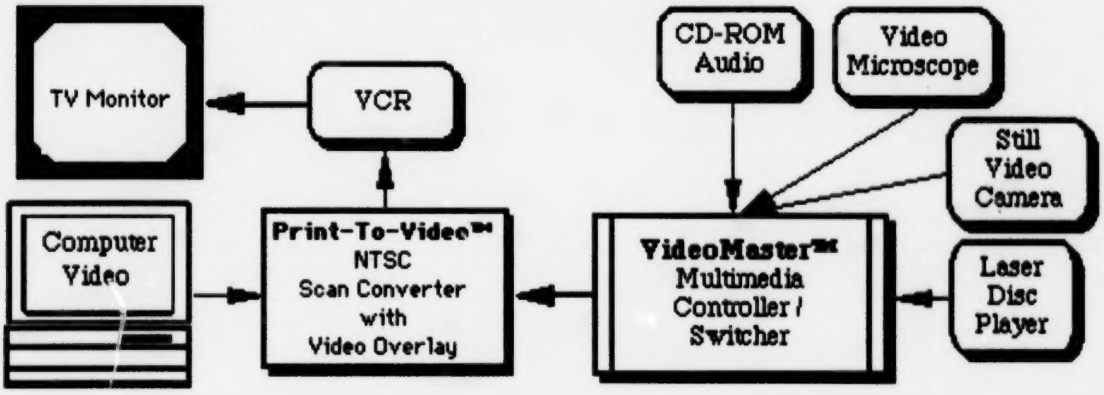
4. VideoMaster™ ($450) is an extremely versatile and inexpensive media controller and switching device. This product provides the opportunity to incorporate various media devices into the presentation. Even less expensive Infra-Red controlled consumer-grade devices such as a home VCR can be placed under computer control.

5. *VCR* Records multimedia presentation for review purposes

6. *Video Camera* Provides close-up views and microscope display

7. *Still-video camera* 50 color images on a reusable two-inch disk

8. *Power CD™* ***Photo CD images*** shown directly onto the TV



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[6]Janice Maloney *The Billion-Dollar CD-ROM Business: An Industry on the Brink--But of What?* Technology & Media. Vol. 1 No. 1 16 May 1994

Possible Software Solutions

Software	Vendor	Price
Digital Chisel *	**(Pierian Spring Software)**	**$159**
HyperCard *	**(Apple)**	**$249**
HyperStudio *	**(Roger Wagner Publications)**	**$149**
Plus for Macintosh *	**(Object Plus Corp.)**	**$495**
SuperCard*	**(Allegiant Technologies Inc.)**	**$495**
mPower*	**(Multimedia Design Corp.**	**$295**
Director*	**(Macromedia)**	**$1,195**
Action	(Macromedia)	$295
ADDmotionII	(Motion Works)	$149
Astound	(Gold Disk)	$399
Authorware	(Macromedia)	$4,995
Cinemation	(Vividus Corp.)	$495
Course Builder	(Discovery System International)	$995
On The Air	(Meyer Software)	$225
Passport	(Passport Designs)	$995
Persuasion	(Aldus)	$395
Power Point	(MicroSoft)	$495
Promotion	(Motion Works)	$395
Special Delivery	(Interactive Media Inc.)	$399

* Has the ability to control external devices.

There are four types of Macintosh-based presentation software packages. Some are text-based slide-show type programs. A second type provides for some type of interactively besides the text. A third group provides access to external devices such as videodisc players and CD-ROMs. A forth group, although very powerful, is too expensive or has such a steep learning curve that I would be reluctant to recommend these to the novice user.

Recommended Software

For Ease of Use --

Digital Chisel™ and HyperStudio™ require no scripting, and are also the least expensive. Each is designed for the education market and can easily produce complete multimedia lessons. They contain features for text, pictures, QuickTime™ movies, sounds animation, hypertext, hyperlinking, interactive presentations, videodisc and CD-ROM (Audio) control and animation.

For Scripting Control --

HyperCard™, the original product capable of fulfilling each of the requirements needed to be useful in education is no longer included free with each Macintosh purchased. Now there are other perhaps more useful products to consider, some of which are capable of importing and modifying existing HyperCard stacks. **SuperCard™** and **Plus for Macintosh™** can both convert HyperCard stacks Both of these applications extend the power of HyperTalk programming language and are (will be) cross-platform compatible with Windows 3.0.. SuperCard has the advantage of also providing additional scripting power to Digital Chisel.

HyperCard --> SuperCard <==> Digital Chisel

Useful Supplemental Applications

Presenting Now...™ A projected electronic "scratch pad" provides a dynamic "instant replay" analysis of each visual image using oversized pointers, colored lines, arrows, rectangles, text, and paintbrushes

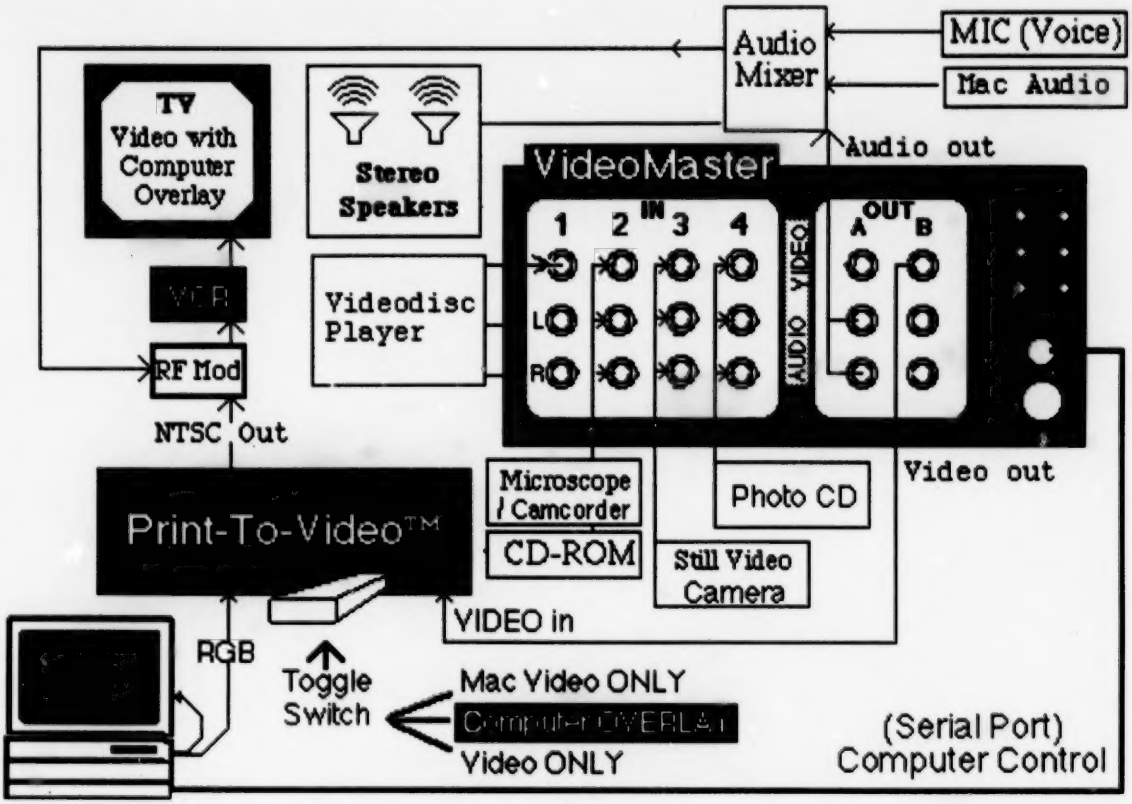
Flying Colors ™ can be used to very easily produce graphic screens to be used in other applications

ClickChange™ a collection of tools to customize the look and feel of the Macintosh

MovieWorks a powerful tool to create interactive QuickTime movies

Living Album Create electronic albums with photos, sound and video

Wiring for Video Overlay, Video Switching & Audio Mixing



Footnote

Television versus LCD and RGB projections systems

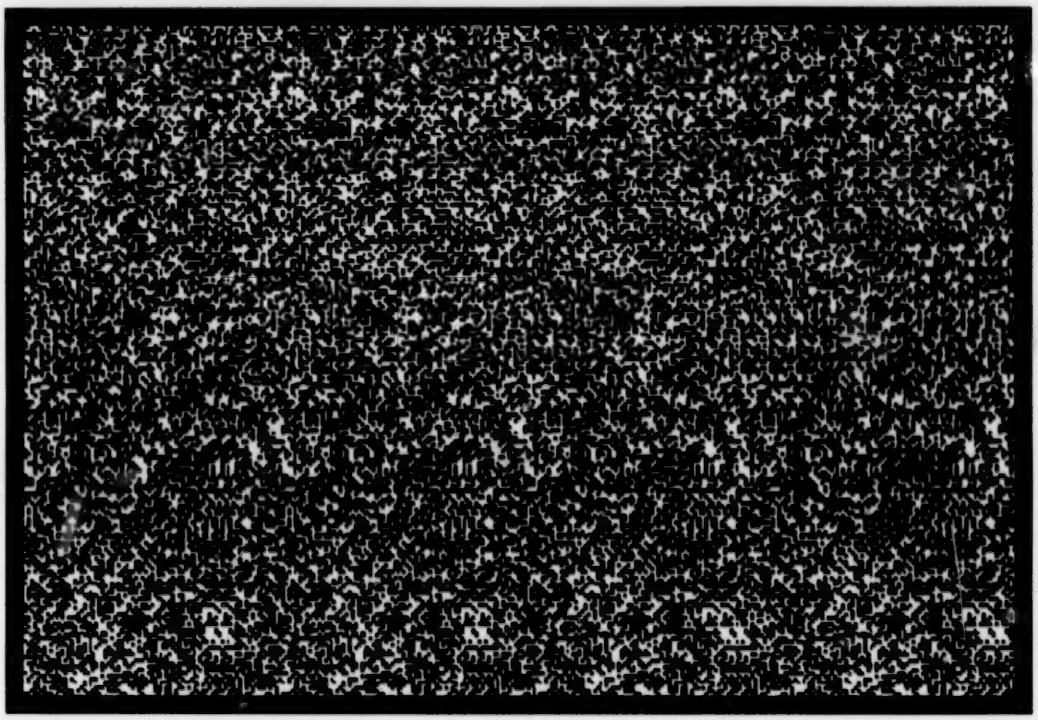
Although both LCD and RGB projection systems provide a larger display than television, tests have shown that just increasing the size of the image does not necessarily improve its effectiveness. Higher achievement scores have been obtained using a television than with a larger rear-screen projection system. These large screens require students spend more time searching for key information in darkened rooms.

Two potential drawbacks exist in using video displays (TV sets) for computer projection. Displayed text is *more fatiguing* than reading printed text materials and small *text is not readable*. These problems are eliminated by using larger fonts. Keeping text to a minimum frees students to participate in discussions and not become bogged down copying detailed textual information. Design experts recommend a maximum of 7 lines and 20 words per screen. Learning is better enhanced if text is restricted to seven words. Seven items, plus or minus two, is the approximate limit to the number people can remember.

The second problem is single pixel flickering. The best solution is to avoid using single-pixel horizontal lines or dots. Software solutions include CloseView™ an extension included with every Macintosh computer and ClickChange™ a collection of tools to customize the look and feel of the Macintosh (Dubl-Click Software). Hardware solutions are also present to filter out the flickering.

Epilogue

ANALOGY: New information, like the following "STARE-E-O" image, at first it appears as lot of incomprehensible "useless" data. But, once the pattern is recognized it reveals an interesting 3-D image of the above diagram. Likewise, multimedia in the hands of the teacher has the power to transform data into meaningful knowledge in the lives of students.



"To look is one thing.
To see what you look at is another.
To understand what you see is a third.
To learn from what you understand is still something else
But to act on what you learn is all that really matters."

The TALMUD

If you would like additional information regarding the hardware or woftware by contact me at

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